

**METHOD OF DEPOSITING AMORPHOUS SILICON BASED
FILMS HAVING CONTROLLED CONDUCTIVITY**ABSTRACT OF THE DISCLOSURE

Deposition methods for preparing amorphous silicon based films with controlled resistivity and low stress are described. Such films can be used as the interlayer in FED manufacturing. They can also be used in other electronic devices which require films with controlled resistivity in the range between those of an insulator and of a conductor. The deposition methods described in the present invention employ the method of chemical vapor deposition or plasma-enhanced chemical vapor deposition; other film deposition techniques, such as physical vapor deposition, also may be used. In one embodiment, an amorphous silicon-based film is formed by introducing into a deposition chamber a silicon-based volatile, a conductivity-increasing volatile including one or more components for increasing the conductivity of the amorphous silicon-based film, and a conductivity-decreasing volatile including one or more components for decreasing the conductivity of the amorphous silicon-based film.